

**WHAT IS CLAIMED IS:**

- 5 1. A digital camera, comprising:  
a CCD imager having light receiving elements vertically and horizontally  
arranged respectively in a first predetermined number and a second predetermined  
number, and including said second predetermined number of vertical transfer registers  
each having said first predetermined number of transfer regions and a horizontal transfer  
register connected to output ends of said vertical transfer registers;  
a timing generator connected to said CCD imager to supply predetermined timing  
signals to said CCD imager, said predetermined timing signals including a first exposure  
10 signal to perform first exposure for a first predetermined period, a first read signal to read  
a first charge created due to said first exposure from first light receiving elements  
positioned vertically intermittently to said vertical transfer registers, a charge moving  
signal to move said first charge to vacant transfer regions of said vertical transfer  
registers, a second exposure signal to perform second exposure for a second  
15 predetermined period different from said first predetermined period, a second read signal  
to read a second charge created due to said second exposure from second light receiving  
elements positioned vertically intermittently to said vertical transfer registers, a first  
vertical transfer signal to vertically transfer said first charge and said second charge on  
said vertical transfer registers, and a first horizontal transfer signal to horizontally transfer  
20 said first charge and said second charge to said horizontal transfer register;  
a first processor connected to said CCD imager and creating one screen of a first  
image signal based on said first charge and said second charge that have been outputted  
from said horizontal transfer register.
- 25 2. A digital camera according to claim 1, wherein said first light receiving  
elements and said second light receiving elements are same light receiving elements.

3. A digital camera according to claim 2, wherein said charge moving signal is a signal to move said first charge simultaneously with or prior to reading out said second charge.

5 4. A digital camera according to claim 2, wherein said first charge has a moving distance greater than a distance that said first light receiving elements vertically continue.

5. A digital camera according to claim 4, wherein said first light receiving elements of  $N$  ( $N \geq 1$ ) in number exist vertically intermittently for each, and said first charge moving over at least a distance corresponding to said first light receiving elements of  $N$  in number.

10 6. A digital camera according to claim 1, further comprising a monitor connected to said first processor and displaying an image corresponding to said first image signal.

7. A digital camera according to claim 1, further comprising:

a shutter button; and

15 a shutter member arranged in front of said CCD imager and blocking off light from incoming to said CCD imager;

said timing signal further including a third exposure signal outputted responsive to operation of said shutter button and performing third exposure for a third predetermined period, a third read signal to read a third charge created due to said third exposure from all said light receiving elements to said vertical transfer registers, a second vertical transfer signal to vertically transfer said third charge on said vertical transfer registers, a second horizontal transfer signal to horizontally transfer said third charge given to said horizontal transfer register, a fourth exposure signal to perform fourth exposure after said third exposure, a drive signal outputted upon elapsing a fourth predetermined period different from said third predetermined period from a start of said fourth exposure and driving said shutter member, a fourth read signal to read a fourth charge created due to said fourth

20

25

exposure from all said light receiving elements to said vertical transfer registers after completing vertical transfer of said third charge, a third vertical transfer signal to vertically transfer said fourth charge over said vertical transfer registers, and a third horizontal signal to horizontally transfer said fourth charge given to said horizontal transfer register, wherein further comprising:

a second processor connected to said CCD imager and creating one screen of a second image signal based on said third charge and said fourth charge that are outputted from said horizontal transfer register.

8. A digital camera according to claim 7, further comprising a recorder connected to said second processor and recording said second image signal in a completion state to a recording medium.

9. A digital camera, comprising:

a CCD imager having light receiving elements vertically and horizontally arranged respectively in a first predetermined number and a second predetermined number, and including said second predetermined number of vertical transfer registers each having said first predetermined number of transfer regions and a horizontal transfer register connected to output ends of said vertical transfer registers;

a first exposure means for giving first exposure for a first predetermined period to said CCD imager;

a first read means for reading a first charge created due to said first exposure from first light receiving elements positioned vertically intermittently to said vertical transfer registers;

a charge moving means for moving said first charge to vacant transfer regions of said vertical transfer registers;

a second exposure means for giving second exposure to said CCD imager for a

second predetermined period different from said first predetermined period;

a second read means for reading second charge created due to said second exposure from second light receiving elements positioned vertically intermittently to said vertical transfer registers;

5 a first vertical transfer means for vertically transferring said first charge and said second charge over said vertical transfer registers;

a horizontal transfer means for horizontally transferring said first charge and said second charge given to said horizontal transfer register; and

a first image signal creating means for creating one screen of a first image signal  
10 based on said first charge and said second charge that have been outputted from said horizontal transfer register.

10. A digital camera according to claim 9, wherein said first light receiving elements and said second light receiving elements are same light receiving elements.

11. A digital camera according to claim 10, wherein said charge moving means  
15 moves said first charge simultaneous with or prior to reading out said second charge.

12. A digital camera according to claim 10, wherein said first charge has a moving distance greater than a distance that said first light receiving elements vertically continue.

13. A digital camera according to claim 12, wherein said first light receiving elements of  $N$  ( $N \geq 1$ ) in number exist vertically intermittently for each, and said first  
20 charge moving over at least a distance corresponding to said first light receiving elements of  $N$  in number.

14. A digital camera according to claim 9, wherein said first exposure means and said second exposure means are of an electronic shutter scheme to give said first exposure and said second exposure.

25 15. A digital camera according to claim 9, further comprising a monitor to display

an image corresponding to said first image signal.

16. A digital camera according to claim 9, further comprising:

a shutter button;

5 a shutter member arranged in front of said CCD imager and blocking off light from incoming to said CCD imager;

a third exposure means for giving third exposure for a third predetermined period responsive to operation of said shutter button;

a third read means for reading out a third charge created due to said third exposure from all said light receiving elements to said vertical transfer registers;

10 a second vertical transfer means for vertically transferring said third charge over said vertical transfer registers;

a second horizontal transfer means for horizontally transferring said third charge delivered to said horizontal transfer register;

a fourth exposure means for starting fourth exposure after said third exposure;

15 a drive means for driving said shutter member upon elapsing a fourth predetermined period different from said third predetermined period from a start of said fourth exposure;

20 a fourth read means for reading a fourth charge created due to said fourth exposure from all said light receiving elements to said vertical transfer registers after completing vertical transfer of said third charge;

a third vertical transfer means for vertically transferring said fourth charge over said vertical transfer registers;

a third horizontal transfer means for horizontally transferring said fourth charge given to said horizontal transfer register; and

25 a second image signal creating means connected to said CCD imager and creating

one screen of a second image signal based on said third charge and said fourth charge that have been outputted from said horizontal transfer register.

17. A digital camera according to claim 16, further comprising a recording means to record said second image signal in a completion state to a recording medium.